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Postoperative Analgesic Effect of Pudendal Nerve Block Following Anterior and Posterior Vaginal Wall Repair

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Abstract

***Background**: Pudendal nerve block (PNB) provides anesthesia and analgesia for minor gynecological surgeries.*

***Objective**: To determine the effectiveness of PNB in providing postoperative analgesia for patients undergoing anterior and posterior vaginal wall repair (APR) under spinal anesthesia.*

***Materials and methods**: when 50 adult patients, aged 25-50 years, ASA physical status I and II were scheduled for Anterior and posterior vaginal repair and involved in this study. Spinal anesthesia was performed and at the end of surgery, patient were divided randomly into two equal groups. In bupivacaine group (group B), local anesthetics (0.5 ml/kg bupivacaine 2.5%) had been given in three equal divided volumes for an ultrasound guided pudendal nerve block, skin infiltration to the vulva and deep infiltration to the perineum. In control group (group C), the same volume of normal saline had been given. Pain was assessed by using the visual analogue score (VAS).*

***Results**: Prolonged duration of postoperative analgesia and reduced total analgesic dose in Bupivacaine group than control group were observed.*

***Conclusion**: Pudendal nerve block provides a satisfactory postoperative analgesic effects and reduces the need for opioid consumption*

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Conflict of interest
None declared by author

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Keywords:
Bupivacaine, Pudendal nerve block, Anterior and posterior vaginal wall repair, Postoperative analgesia

1 INTRODUCTION

Anterior and posterior vaginal repair (APR) is a surgical procedure that had been used for the treatment of pelvic organs prolapse (1,2). Pudendal nerve (PN) block is one of several techniques used to provide anesthesia and analgesia to the genital area and reduces the need for opioid consumption postoperatively with their associated side effects. PN originated from 2nd ,3rd and 4th sacral rami and pass through the lesser sciatic foramen between two ligaments and then directed into the pudendal canal near the ischial tuberosity (3). Within the pudendal canal the nerve divides into:

1. Inferior rectal nerve (inferior haemorrhoidal nerve): In about fifty percent of cases, it is arise directly from the 4th anterior sacral primary ramus and supplies the anal mucosa and perianal region.
2. Dorsal nerve of penis or clitoris
3. Perineal nerve that supplying vulva and perineum (4-11).

Apart from the branches of pudendal nerve, the ilio-inguinal nerve also send branches to the mons pubis and labia majora (12). Therefore, the ideal method to produce a complete nerve block for APR surgeries should include the blocking of the areas that supplied directly inferior rectal and ilio-inguinal nerves together with PNB {12). The objective of the current study is to evaluate the postoperative analgesic effect of intraoperative pudendal block for patient undergoing Anterior and posterior vaginal repair.

2 PATIENTS AND METHODS

This study was applied from 1st of February 2021 to 1st of October 2021 when 50 adult patients, aged 25-50 years, ASA physical status I and II were scheduled for Anterior and posterior vaginal repair and involved in this study.

Exclusion criteria from this study include : Patients with ASA physical status > II , patients receiving analgesics, allergy to local anesthetics, refusal of the patient , history of bleeding tendency, neuropathies, diabetes mellitus, hypertension, pregnant women , infection at the site of infection and immune compromised patients. Informed consent was taken from all the patients who were divided into two groups randomly. An Intravenous (IV) access

was inserted in both groups and received 10 ml/kg ringer lactate solution immediately prior to spinal anesthesia. Standard monitoring include lead II electrocardiogram, pulse oximetry and non- invasive blood pressure monitor. Spinal anesthesia was performed using gauge 25 spinal needle at L3-L4 interspace with patients in the sitting position and using 2.5% bupivacaine 0.5%. Patients remained in the sitting position for 4 minutes then placed in lithotomy position and surgery (APR) was done. Vital sign was monitored and recorded at 0, 15, 30 and 60, 90, 120 and minutes following spinal anesthesia. At the end of surgery, patient were divided randomly into two equal groups. In bupivacaine group (group B), local anesthetics (0.5 ml/kg bupivacaine 2.5%) had been given in three equal divided volumes for an ultrasound guided pudendal nerve block, skin infiltration to the vulva and deep infiltration to the perineum. In control group (group C), the same volume of normal saline had been given. Pain was assessed by using the visual analogue score (VAS) (13) in which a score of 0 indicates no pain and a score of 10 worst pain. The VAS measurements were obtained every three hours post-operatively at 3, 6,9,12,15,18,21 and 24 hours. Rescue analgesic in the form of slow IV bolus of 50 mg of tramadol was administered at the VAS score of 4. Time of first rescue analgesic and the total analgesic during the first 24 hours post-operative period were recorded.

Statistical analysis

The analysis was carried out with the SPSS program; version 23.The qualitative data had been analyzed by using of Chi - square. The quantitative data had been analyzed by using student's paired t-test was used. VAS were analyzed by the Friedman test.

3 | RESULTS

Demographic parameters (age and sex) revealed that there was no significant difference in both groups. The mean duration of surgery was 79.55±19.58 minutes in Group C while it was 75.22 ± 21.33 minutes in Group B which is statically not significant (**Table1**). There was no significant difference between both groups regarding the mean changes in heart rate and mean blood pressure during 0,15,30,, 90,120 and 180 minutes following spinal anesthesia (**Table 2**).

Regarding the onset of pain, was much earlier in Group C. Mean of VAS was higher in group C > B. There was no significant difference between the two group regarding VAS at 3rd postoperative

hour. The maximum mean of VAS score occur at 6th in control group, while it occurs at 12th in bupivacaine group. There was significant difference between the two group regarding VAS at 6th, 9th and 12nd postoperative hours (**Table 3 and Figure 1**).

The total dose of analgesic (tramadol in mgs in 24 hours) was very significantly lower in group B than group C. (**Table 4**).

Table 1: Comparison of Age, body weight and duration of surgery of the studied groups

Parameters	Control group	Bupivacaine group	P. value
Age (year)	37.45 ± 10.80	34.05 ± 10.01	0.332
Body weight (kg)	75.52 ± 8.80	72.90 ± 7.72	0.411
Duration of surgery (minutes)	79.55 ± 19.58	75.22 ± 21.33	0.352

Table 2: Comparison of heart rate and mean arterial blood pressure in both groups at 0, 15, 30, 90, 120 and 180 minutes following spinal anesthesia

Time (minute)	Parameter	Control group	Bupivacaine group	P. value*
		Mean ± SD	Mean ± SD	
0	HR	94 ± 13	87 ± 15	0.425
	MBP	77 ± 10	73 ± 8	0.440
15	HR	88 ± 10	90 ± 12	0.321
	MBP	64 ± 12	62 ± 8	0-423
30	HR	93 ± 13	88 ± 11	0.401
	MBP	72 ± 11	76 ± 6	0.430
60	HR	92 ± 13	84 ± 10	0.396
	MBP	68 ± 10	65 ± 8	0.382
90	HR	90 ± 11	86 ± 9	0.390
	MBR	65 ± 10	62 ± 8	0.401
120	HR	87 ± 8	85 ± 7	0.330
	MBP	68 ± 7	65 ± 9	0.359
180	HR	84 ± 6	82 ± 7	0.410
	MBP	70 ± 6	68 ± 4	0.362
SD: Standard deviation of mean, * not significant in all comparisons				

Table 3: Comparison of visual analogue score (VAS) between both groups. At different assessment time

Time (hours)	Control group VAS (mean ± SD)	Bupivacaine group VAS (mean ± SD)	P. value
3	1.5 ± 1.0	1.3 ± 0.8	0.422 ns
6	4.3 ± 1.2	2.4 ± 1.1	< 0.001 sig
9	3.7 ± 1.2	2.7 ± 0.8	< 0.001 sig
12	2.8 ± 0.9	2.1 ± 0.5	0.001 sig
15	2.4 ± 0.6	2.1 ± 0.5	0.163 ns
18	2..1 ± 0.3	1.8 ± 0.5	0.262 ns
21	2.3 ± 0.5	2.1 ± 0.4	0.374 ns
24	1.8 ± 0.7	1.7 ± 0.5	0.466 ns
SD: Standard deviation of mean, sig: significant, ns: not significant			

Table 4: Total postoperatively analgesic (tramadol) doses in milligram per 24 hours for the studied groups

Dose (mg/24 hours)	Control group	Bupivacaine group	P. value
Mean	88.55	35.45	<0.001 sig
Standard deviation	15.25	12.88	
sig: significant			

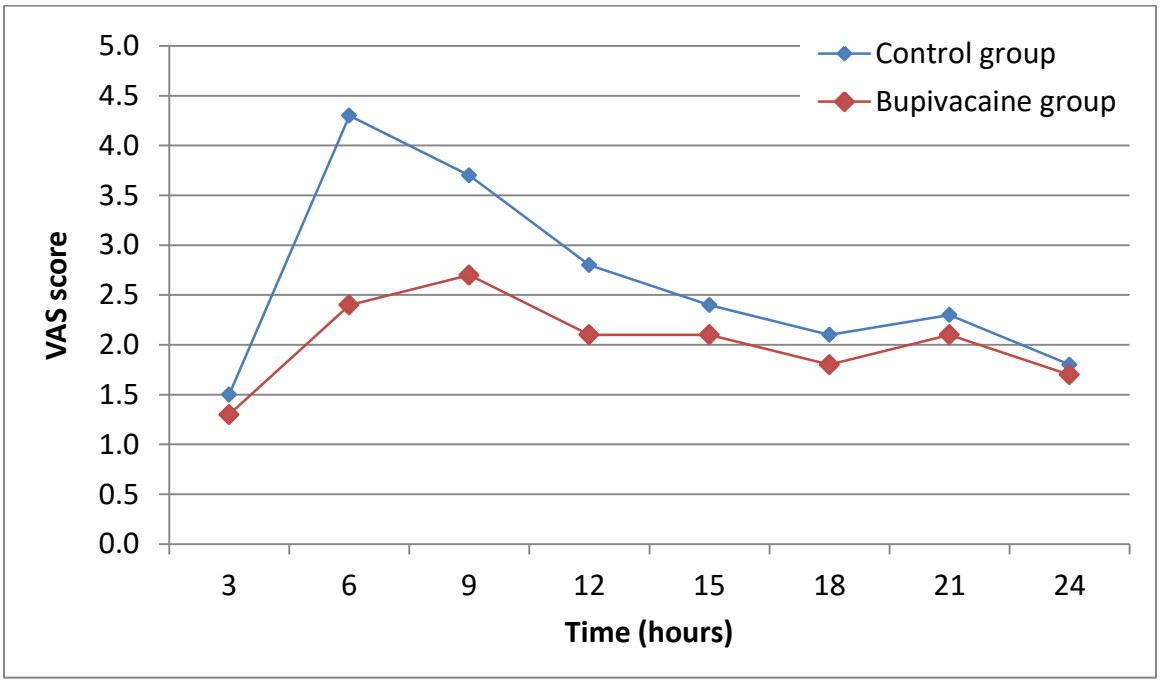

Figure 1: Line-Marker chart comparing the change in VAS scores in control and bupivacaine groups

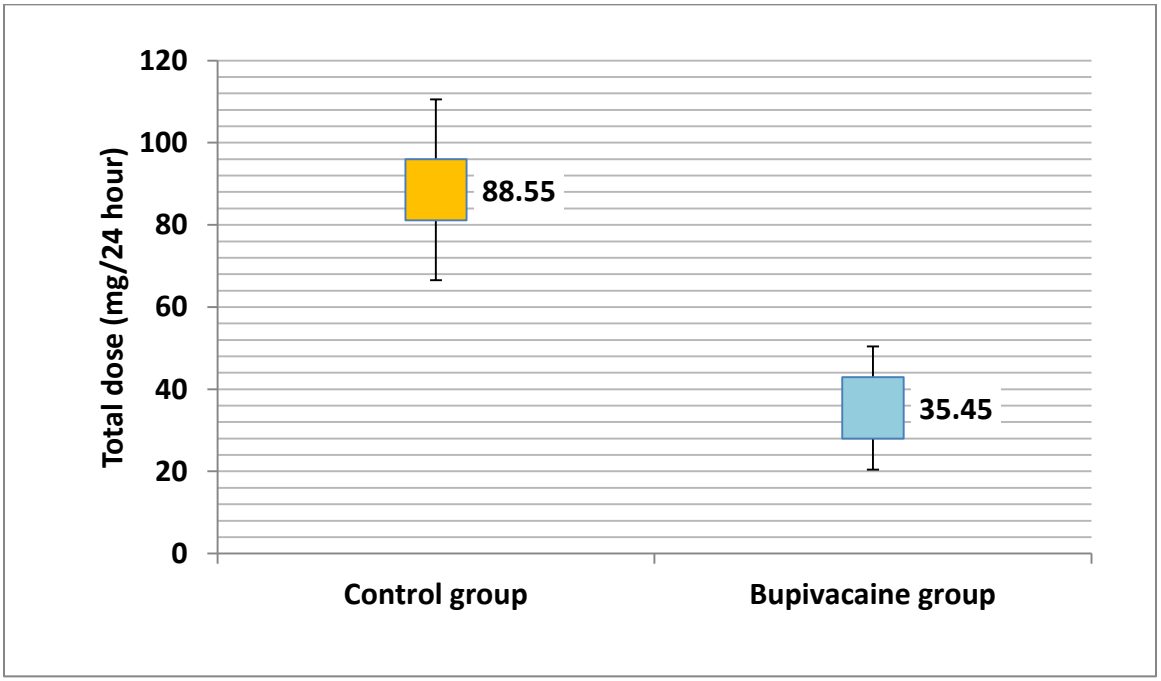

Figure 2: Box and whisker chart for the comparison of total postoperative dose of analgesic (tramadol) required in both studied group

4 DISCUSSION

This study is focused on the impact of pudendal nerve block on the outcome of pain control after APR surgeries. There was significant difference between the two group regarding VAS at 6th, 9th and 12nd postoperative hours with prolonged duration of postoperative analgesia and reduced total analgesic dose in Bupivacaine group than control group. O'Neal et al (14) supported our study although their study focused on paracervical block. Aissaoui (15) and his colleague agree with the current study. They found that intraoperative pudendal nerve block can reduce post-operative pain intensity and their required analgesic doses. Ismail and his colleagues found that bilateral injection of local anesthetics by using nerve stimulator result in a reduction in the post-operative visual analogue score and rapid return to normal activity (16).

5 CONCLUSIONS

Pudendal Nerve Block provides a satisfactory postoperative analgesic effects and reduces the need for opioid consumption. However, we suggest to conduct further studies with larger sample size for more precise conclusions

Ethical Issue:

All ethical issues were approved by the author, in accordance with Ethical Principles of Declaration of Helsinki of the world Medical Association, 2013, for research involving human subjects

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